P.O. Box 4146
Prescott, AZ 86302 USA
(520) 778-4637

# Electrical Sensitivity Network

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Dr. Mary Wolfe
EMF-RAPID Program/LCBRA NIEHS
NIH
P.O. Box 12233
MD EC-16
Research Triangle Park, NC 27709

Dear Dr. Wolfe:

This letter with enclosures represents my comments in response to the NIEHS Working Group Report of August, 1998.

1) Regarding electrical sensitivity (ES), the working group report implies that ES has no history before the introduction of computers with video display screens in the late 1970's. However, reports from the former Soviet Union and Eastern Europe regarding non-cancer, neurological and cardiovascular illness due to various non-ionizing electromagnetic exposures predate computer use. Quoting from a document prepared by the Library of Congress, "As far back as 1933, Soviet scientists were beginning to show interest in the effects of electromagnetic fields (EMF's) on the central nervous system (CNS) of both humans and animals."[1] In a 1960. book prepared by the Academy of Medical Sciences, USSR, the symptom picture of workers overexposed to non-ionizing radiation was summarized as being "...character-ized primarily by functional disorders of the nervous and cardiovascular systems...".[2] Comparing their list of symptoms with the current working group report's list of ES symptoms, sleep disturbances, fatigue, headache, and cognitive impairment are representative of both lists. The working group report did not review this historical health information.

2) The working group report mentioned "...a similarity in the symptoms of individuals with electrical hypersensitivity and individuals suffering from 'multiple chemical hypersensitivity'...". ES and multiple chemical sensitivity (MCS) can occur singularly or together. Their co-occurrence seems most common in the later, more severe, stages of either illness. I attribute this crossover of illnesses to the neurotoxic effects of EMFs. (See the enclosed article "Microwaves Imitate Pesticides".)[3] Because MCS has been linked, at least in part, to chronic fatigue syndrome (CFS) and Gulf War syndrome (GWS), case reports of ES are to be expected within these groups as well. Another illness apparently putting the patient at increased risk of becoming ES is fibromyalgia. According to Devin Starlanyl, M.D. in her book **Fibromyalgia and**

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**Chronic Myofascial Pain Syndrome,** regarding ES she states that "...although not restricted to those people with fibromyalgia (FMS) or FMS/MPS (Myofascial Pain Syndrome) Complex, I have observed (ES) consistently in people with either of these conditions."[4]

3) In December, 1992, the Environmental Protection Agency (EPA) published a booklet entitled "Electric and Magnetic Fields: An EPA Perspective on Research Needs and Priorities for Improving Health Risk Assessment".[5] In the section about human nervous system effects, this booklet states, "Serotonin, melatonin, dopamine, and noradrenaline have been the focus of much attention in the brain sciences...Their metabolites can be monitored in easily accessible body fluids and provide information about the role of neuromodulators in disturbed nervous system function. Data of this type from exposed human subjects are not available but relevant animal experiments report that neurotransmitter metabolite levels are lowered in primates and that circadian patterns of neurotransmitters and their metabolites are desynchronized in rodents exposed to EMF. The few studies in which human subjects have been exposed to EMF in controlled laboratory settings describe the following effects: changes in brain evoked-potential indicative of possibly slowed information processing, slowed reaction time and altered behavioral performance in which ability to gauge the passage of time was a pivotal component, and altered cardiovascular function including slowed heart rate and pulse that may indicate direct action on the heart or the neurochemicals controlling cardiac function."

Animal studies showing reduction of the serotonin metabolite 5-HIAA due to electromagnetic exposure include the work of both Seegal and Zecca, which were briefly mentioned in the working group report under Neurophysiology (p. 226). However, the working group report did not disclose that one study by Seegal and one by Zecca have each shown a reduction in animal 5-HIAA due to EMF exposure that did not correct during the observed post-exposure period.[6,7]

Human studies regarding serotonin and 5-HIAA levels related to electromagnetic exposures have occurred also, according to published reports by Felix Gad Sulman, M.D., D.V.M. of Israel and A. James Giannini, M.D. of the U.S.A.[8,9,10] (See enclosed.) None of these studies with humans were included in the working group report. Overall, the human studies show an elevated serotonin level in certain individuals overexposed to either an artificial or a natural electromagnetic source. Both Sulman and Giannini believed that in these cases serotonin was not breaking down into 5-HIAA at the expected rate, causing an excess of serotonin in the body which they called the "serotonin irritation syndrome".

Failure of serotonin metabolism may also account for the much discussed reduction of melatonin in EMF studies as serotonin is a precursor of melatonin.

4) Modern provocation studies were discussed in the working group report but many problems that patients encounter while taking these tests were not reviewed.

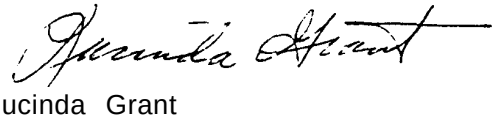
Individual reaction responses to exposures vary; these responses may occur as delayed reactions or prolonged effects. For instance, certain pain reactions may be easier for the ES patient to associate with brief, periodic EMF test exposures rather than fatigue, nausea, etc. which may not abate as soon as the test exposure ceases.

The Soviets found that the Selye model of stress response (stress/adaptation/ exhaustion) applied in the case of electromagnetic exposures, as EMF is a physical stressor on the body.[11] In one Swedish provocation study, it was reported that some ES patients reacted to EMFs with "...quite correct responses to begin with, but later more random...", which the ES patients described as exhaustion, reaching a point where their symptoms became so apparent and prolonged that it was then more difficult to tell whether the test exposure was on or off.[12]

Further, test conditions may have other electromagnetic exposures besides those being tested, which can affect test results: wall wiring, lighting (particularly fluorescent), computer equipment on in the vicinity, ambient broadcast frequencies, geopathic stress, stray voltage, etc. Some ES patients are also MCS, so ambient chemical exposures could affect their EMF provocation test results as well.

In conclusion, electrical sensitivity has a history predating the computer era as evidenced by records from the former Soviet Union and Eastern Europe which show a symptom picture similar to today's electrically sensitive patients. The symptoms of ES can be very painful and sometimes life-threatening, such as heart problems, seizures, and strokes due to electromagnetic exposures. Electrical sensitivity is a growing and serious public health problem. Therefore, the NIEHS needs to specifically request funding for the purpose of better understanding electrical sensitivity, with emphasis on prevention, diagnosis, and treatment. Future EMF health studies should consider radio frequency and microwave exposures as well as lower frequencies and assess both cancer and non-cancer health effects.

Sincerely,



Lucinda Grant
Director

LG:ja

Enclosures

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